CONVERSION OF TEMPERATURES FROM THE 1948 AND 1968 SCALES TO ITS-90

This table gives temperature corrections from older scales to the current International Temperature Scale of 1990 (see the preceding table for details on ITS-90). The first part of the table may be used for converting Celsius temperatures in the range -180 to 4000°C from IPTS-68 or IPTS-48 to ITS-90. Within the accuracy of the corrections, the temperature in the first column may be identified with either t_{68}, t_{48}, or t_{90}. The second part of the table is designed for use at lower temperatures to convert values expressed in kelvins from EPT-76 or IPTS-68 to ITS-90.

The references give analytical equations for expressing these relations. Note that Reference 1 supersedes Reference 2 with respect to corrections in the 630 to 1064°C range.

References

1. Burns, G. W. et al., in *Temperature: Its Measurement and Control in Science and Industry*, Vol. 6, Schooley, J. F., Ed., American Institute of Physics, New York, 1993.
2. Goldberg, R. N. and Weir, R. D., *Pure and Appl. Chem.,* 1545, 1992.

t/°C	$t_{90}-t_{68}$	$t_{90}-t_{48}$	t/°C	$t_{90}-t_{68}$	$t_{90}-t_{48}$	t/°C	$t_{90}-t_{68}$	$t_{90}-t_{48}$	t/°C	$t_{90}-t_{68}$	$t_{90}-t_{48}$
−180	0.008	0.020	290	−0.039	0.032	760	0.04	0.60	2400	−1.00	3.2
−170	0.010	0.017	300	−0.039	0.034	770	0.05	0.63	2500	−1.07	3.4
−160	0.012	0.007	310	−0.039	0.035	780	0.05	0.66	2600	−1.15	3.7
−150	0.013	0.000	320	−0.039	0.036	790	0.05	0.69	2700	−1.24	3.8
−140	0.014	0.001	330	−0.040	0.036	800	0.05	0.72	2800	−1.32	4.0
−130	0.014	0.008	340	−0.040	0.037	810	0.05	0.75	2900	−1.41	4.2
−120	0.014	0.017	350	−0.041	0.036	820	0.04	0.76	3000	−1.50	4.4
−110	0.013	0.026	360	−0.042	0.035	830	0.04	0.79	3100	−1.59	4.6
−100	0.013	0.035	370	−0.043	0.034	840	0.03	0.81	3200	−1.69	4.8
−90	0.012	0.041	380	−0.045	0.032	850	0.02	0.83	3300	−1.78	5.1
−80	0.012	0.045	390	−0.046	0.030	860	0.01	0.85	3400	−1.89	5.3
−70	0.011	0.045	400	−0.048	0.028	870	0.00	0.87	3500	−1.99	5.5
−60	0.010	0.042	410	−0.051	0.024	880	−0.02	0.87	3600	−2.10	5.8
−50	0.009	0.038	420	−0.053	0.022	890	−0.03	0.89	3700	−2.21	6.0
−40	0.008	0.032	430	−0.056	0.019	900	−0.05	0.90	3800	−2.32	6.3
−30	0.006	0.024	440	−0.059	0.015	910	−0.06	0.92	3900	−2.43	6.6
−20	0.004	0.016	450	−0.062	0.012	920	−0.08	0.93	4000	−2.55	6.8
−10	0.002	0.008	460	−0.065	0.009	930	−0.10	0.94			
0	0.000	0.000	470	−0.068	0.007	940	−0.11	0.96	T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$
10	−0.002	−0.006	480	−0.072	0.004	950	−0.13	0.97	5	−0.0001	
20	−0.005	−0.012	490	−0.075	0.002	960	−0.15	0.97	6	−0.0002	
30	−0.007	−0.016	500	−0.079	0.000	970	−0.16	0.99	7	−0.0003	
40	−0.010	−0.020	510	−0.083	−0.001	980	−0.18	1.00	8	−0.0004	
50	−0.013	−0.023	520	−0.087	−0.002	990	−0.19	1.02	9	−0.0005	
60	−0.016	−0.026	530	−0.090	−0.001	1000	−0.20	1.04	10	−0.0006	
70	−0.018	−0.026	540	−0.094	0.000	1010	−0.22	1.05	11	−0.0007	
80	−0.021	−0.027	550	−0.098	0.002	1020	−0.23	1.07	12	−0.0008	
90	−0.024	−0.027	560	−0.101	0.007	1030	−0.23	1.10	13	−0.0010	
100	−0.026	−0.026	570	−0.105	0.011	1040	−0.24	1.12	14	−0.0011	−0.006
110	−0.028	−0.024	580	−0.108	0.018	1050	−0.25	1.14	15	−0.0013	−0.003
120	−0.030	−0.023	590	−0.112	0.025	1060	−0.25	1.17	16	−0.0014	−0.004
130	−0.032	−0.020	600	−0.115	0.035	1070	−0.25	1.19	17	−0.0016	−0.006
140	−0.034	−0.018	610	−0.118	0.047	1080	−0.26	1.20	18	−0.0018	−0.008
150	−0.036	−0.016	620	−0.122	0.060	1090	−0.26	1.20	19	−0.0020	−0.009
160	−0.037	−0.012	630	−0.125	0.075	1100	−0.26	1.2	20	−0.0022	−0.009
170	−0.038	−0.009	640	−0.11	0.12	1200	−0.30	1.4	21	−0.0025	−0.008
180	−0.039	−0.005	650	−0.10	0.15	1300	−0.35	1.5	22	−0.0027	−0.007
190	−0.039	−0.001	660	−0.09	0.19	1400	−0.39	1.6	23	−0.0030	−0.007
200	−0.040	0.003	670	−0.07	0.24	1500	−0.44	1.8	24	−0.0032	−0.006
210	−0.040	0.007	680	−0.05	0.29	1600	−0.49	1.9	25	−0.0035	−0.005
220	−0.040	0.011	690	−0.04	0.32	1700	−0.54	2.1	26	−0.0038	−0.004
230	−0.040	0.014	700	−0.02	0.37	1800	−0.60	2.2	27	−0.0041	−0.004
240	−0.040	0.018	710	−0.01	0.41	1900	−0.66	2.3	28		−0.005
250	−0.040	0.021	720	0.00	0.45	2000	−0.72	2.5	29		−0.006
260	−0.040	0.024	730	0.02	0.49	2100	−0.79	2.7	30		−0.006
270	−0.039	0.028	740	0.03	0.53	2200	−0.85	2.9	31		−0.007
280	−0.039	0.030	750	0.03	0.56	2300	−0.93	3.1	32		−0.008

T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$	T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$	T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$	T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$
33		–0.008	57		0.000	81		0.008	150		0.014
34		–0.008	58		0.001	82		0.008	160		0.014
35		–0.007	59		0.002	83		0.008	170		0.013
36		–0.007	60		0.003	84		0.008	180		0.012
37		–0.007	61		0.003	85		0.008	190		0.012
38		–0.006	62		0.004	86		0.008	200		0.011
39		–0.006	63		0.004	87		0.008	210		0.010
40		–0.006	64		0.005	88		0.008	220		0.009
41		–0.006	65		0.005	89		0.008	230		0.008
42		–0.006	66		0.006	90		0.008	240		0.007
43		–0.006	67		0.006	91		0.008	250		0.005
44		–0.006	68		0.007	92		0.008	260		0.003
45		–0.007	69		0.007	93		0.008	270		0.001
46		–0.007	70		0.007	94		0.008	273.16		0.000
47		–0.007	71		0.007	95		0.008	300		–0.006
48		–0.006	72		0.007	96		0.008	400		–0.031
49		–0.006	73		0.007	97		0.009	500		–0.040
50		–0.006	74		0.007	98		0.009	600		–0.040
51		–0.005	75		0.008	99		0.009	700		–0.055
52		–0.005	76		0.008	100		0.009	800		–0.089
53		–0.004	77		0.008	110		0.011	900		–0.124
54		–0.003	78		0.008	120		0.013			
55		–0.002	79		0.008	130		0.014			
56		–0.001	80		0.008	140		0.014			